Ballooning in Percutaneous Transvenous Mitral Commissurotomy: Role of Echocardiography

Poster Contributions
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Background: Since the introduction of the Inoue technique for percutaneous transvenous mitral commissurotomy (PTMC), various criteria have been proposed for ideal balloon sizing. In routine practice, balloon size is chosen based on the patient's height according to a simple formula. We tried to define a simple and practical echocardiographic measure for adjusting balloon size to achieve better success rates and fewer complications.

Methods: Patients with moderate to severe mitral stenosis who were candidates for PTMC were selected. Maximal mitral intercommissural diameter at a fully opened state during diastole was measured by transthoracic echocardiography (both 2D & 3D) and compared with the values from the height-based formula. The last dilated diameter was measured on fluoroscopy during PTMC.

Results: Thirty-six patients [25 (69.4%) women; mean age 31.2 ± 11.6 years] participated. The mean estimated balloon size was 25.5 ± 1.0 mm according to height and 24.3 ± 1.5 mm based on intercommissural diameter. According to the patients’ need, the average final size of balloons used during PTMC was 24.8 ± 1.2 mm (range 22-28 mm). The height-based formula estimated the sizes as being greater (mean difference=0.64 ± 0.8 mm) and echocardiography estimated the sizes as being smaller (mean difference=0.45 ± 0.8 mm) than the final balloon sizes used during PTMC. Using a Bland-Altman plot, an excellent agreement was observed between the two methods. Certain 3D echocardiographic parameters like the MV volume (p=0.0002), the submitral volume (p=0.0005), total MV apparatus volume (p=0.01), annulus diameter (p=0.004) and inter-commisural diameter (0.01) were significantly related to a successful PTMC.

Conclusion: Selection of balloon size according to echocardiographic commissural diameter is a good alternative method. Assuming the possible discrepancy between height-based and commissural-based estimated balloon sizes in some cases, adjustment of balloon sizes according to the maximal commissural diameter may result in acceptable results and fewer complications.